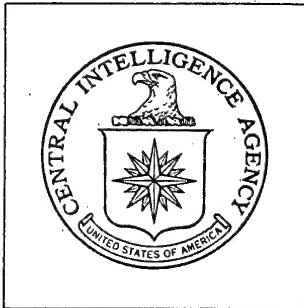


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CONFIDENTIAL



DIRECTORATE OF  
INTELLIGENCE

**Industrial Facilities  
(Non-Military)**

*Basic Imagery Interpretation Report*

**Hungnam Nonferrous Metals Plant**  
(BE Name: Hungnam Copper Refinery)  
**North Korea**



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PAGES 6

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CENTRAL INTELLIGENCE AGENCY  
Directorate of Intelligence  
Imagery Analysis Service

INSTALLATION OR ACTIVITY NAME		COUNTRY
Hungnam Copper Refinery*		KN
UTM COORDINATES	GEOGRAPHIC COORDINATES	25X1
52SCV817100	39-49-55N 127-37-01E	
MAP REFERENCE		
548th RTG. USATC. Series 200. Sheet M0380-4HL. 4th ed.. Apr 68. Scale 1:200,000		25X1
(SECRET)		
LATEST IMAGERY USED	NEGATION DATE (If required)	
	N/A	

## ABSTRACT

A detailed analysis of the Hungnam Nonferrous Metals Plant in North Korea on high-resolution photography shows that the primary products of the plant are refined nonferrous metals, probably copper, lead, and nickel. Secondary products include refined precious metals such as gold and silver which are recovered as by-products from the electrolyte solution used in the refining processes.

This report covers the period from November 1962 to August 1969. In November 1962, the plant contained two electrolytic cell buildings and a precious metals recovery unit which were probably operational. In addition, an ore smelting facility was present, but the first evidence of its operation was in January 1966 when smoke emissions were observed. By October 1963, a third electrolytic cell building was present and was probably operational. Between October 1963 and December 1964 a second precious metals recovery unit was constructed and coal handling facilities for the steamplant were added. Between May 1966 and November 1968 the smelter was expanded. Additional support facilities were also constructed during the reporting period.

This report includes a photograph and detailed line drawing of the plant and a chronological summary of construction and operational status.

\*NOTE: The installation name given in the Data Block is from the Basic Encyclopedia. The results of this study show that the name should be Hungnam Nonferrous Metals Plant.

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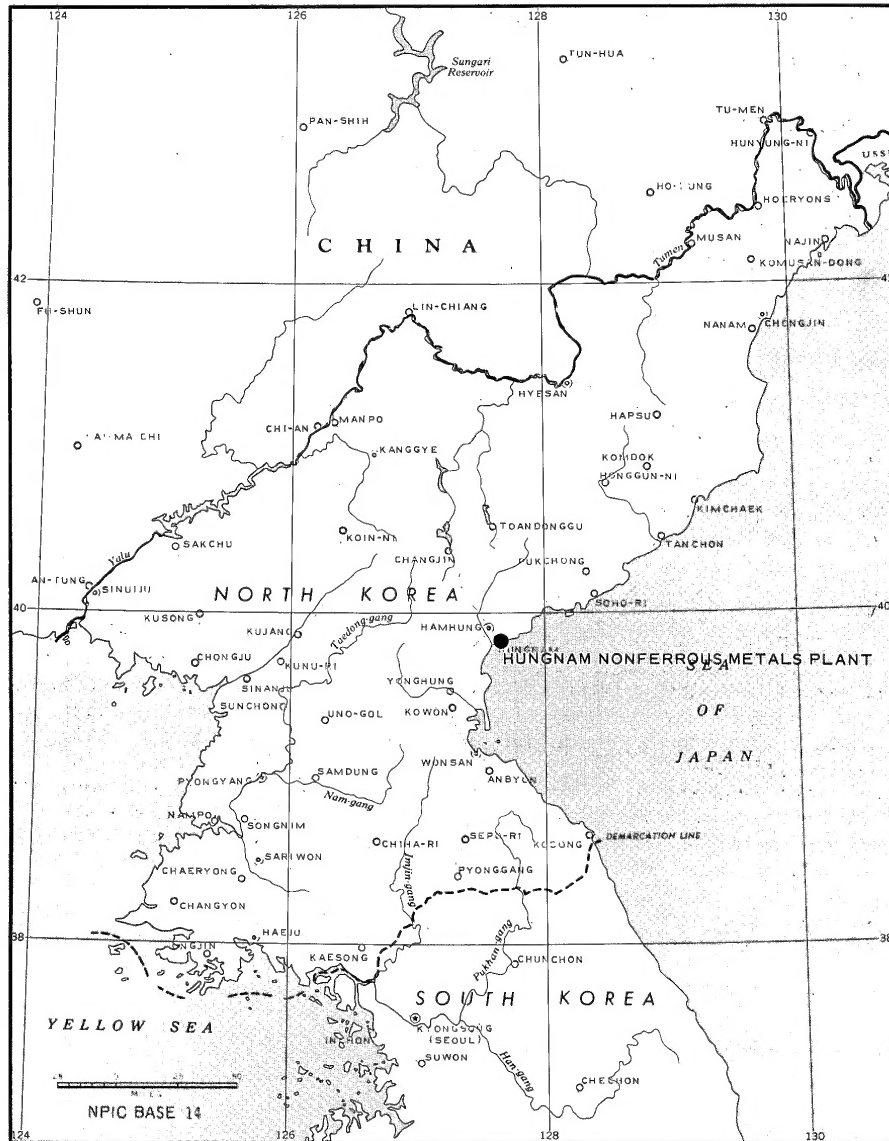


FIGURE 1. LOCATION MAP

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## INTRODUCTION

The Hungnam Nonferrous Metals Plant is about 6 nautical miles southeast of Hamhung, Hamhung-si Province, North Korea (see Figure 1). The nonferrous ores are transported to the plant by rail from nearby mines. Ore smelters at Munchon and Nampo probably send processed ores to the Hungnam plant to be further refined electrolytically.

Electric power for the plant is received from the regional grid through a small transformer yard located to the west of the plant.

## BASIC DESCRIPTION

Physical Features

The plant occupies an irregular-shaped area approximately 1,500 by 500 feet which contains about 18 acres (see Figures 2 and 3). The entire plant is secured with two controlled-access entrances. A rail spur from the main rail line between Wonsan and Tanchon enters the plant from the south. A road enters the plant from the north. Berthing facilities for both oceangoing and coastal vessels are located just south of the plant on the Sea of Japan.

Operational Functions

The primary function of the plant is the electrolytic refining of nonferrous metals which probably include copper, lead, nickel, and precious metals such as gold and silver. Processed ores are probably brought in by rail and truck from other ore smelters. In addition, small quantities of ore are brought by rail into a receiving and storage area. After smelting, these ores are further refined, again by the electrolytic process. The sulfuric acid which is used in the electrolytic cells is probably provided by the sulfuric acid production facilities at an adjacent fertilizer plant. 1/ Precious metals are recovered as by-products from the residues within the electrolytic cells.

The major plant facilities are an ore smelting facility, three electrolytic cell buildings, and precious metals recovery units.

Construction Chronology

The plant has been covered on overhead photography since late 1962. In November 1962, the plant contained two electrolytic cell buildings, a smelter, a precious metals recovery section, and support buildings. Most of the refining facilities at the plant however, predate the Korean conflict of the early 1950's. The facilities were heavily damaged during the conflict and were put back into operation about 1957 with assistance from the Soviet Union.

Between 1962 and 1969, an additional electrolytic cell building was constructed and the steamplant, smelting section, and numerous support facilities were expanded. Some minor support facilities were dismantled during this period. The chronology of construction is shown graphically in Figure 3.

Operational Status

In November 1962, the existing refining facilities (Areas B and C) were probably in partial operation, as evidenced by the presence of rail cars, trucks, and construction activity. The third electrolytic cell building was probably operational in October 1963, when it was first observed complete. On the basis of smoke emissions from associated stacks, the smelting section (Area A) was first observed in operation in 1966 and the casting section of the electrolytic cell building in Area B in March 1968. Smoke emissions were observed at these stacks on all subsequent photography.

On photography of August 1969 the nonferrous metals plant appeared to be in full operation.

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FIGURE 2. HUNGNAM NONFERROUS METALS PLANT.

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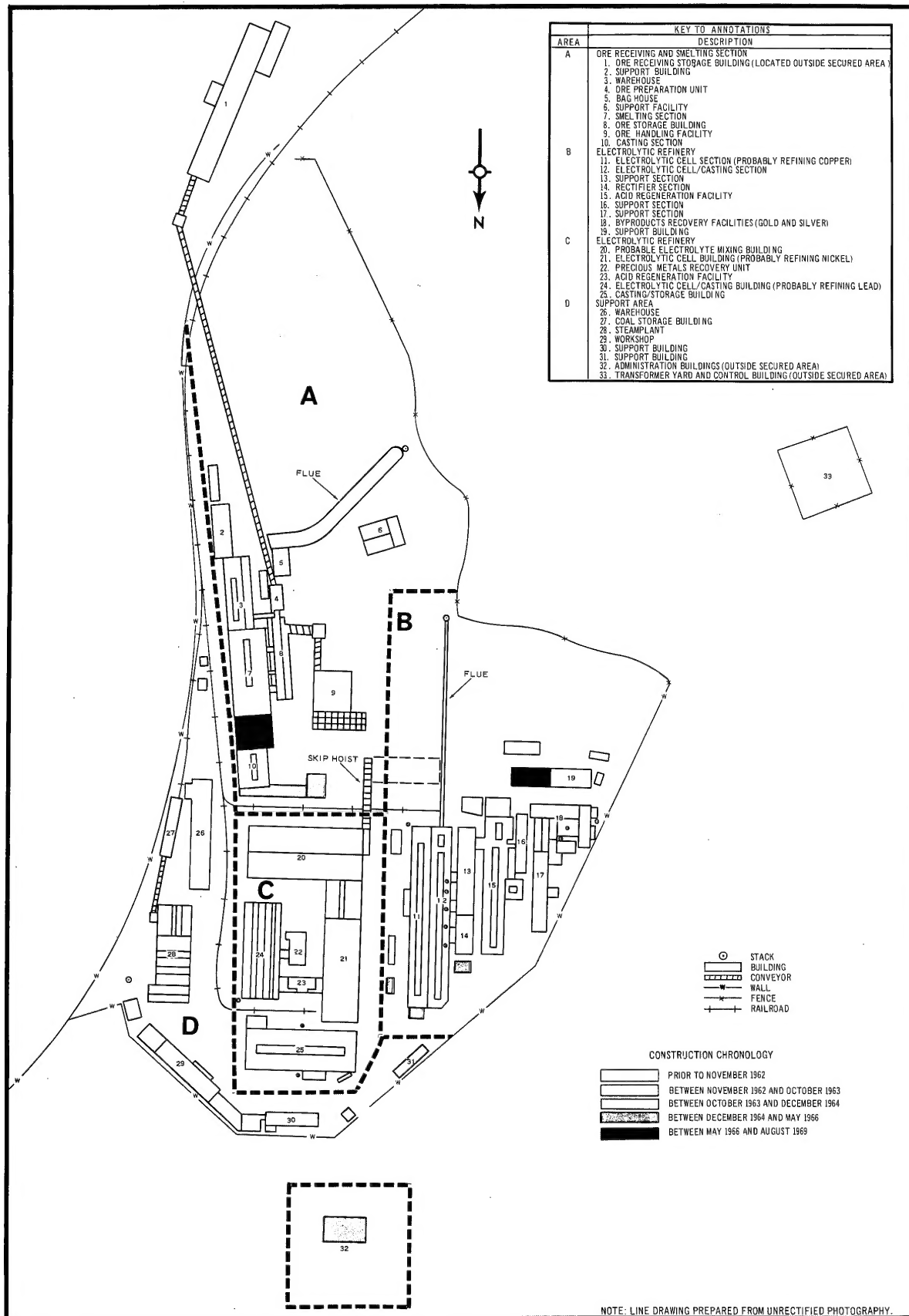


FIGURE 3. HUNGNAM NONFERROUS METALS PLANT, NORTH KOREA.

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REFERENCES

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Map

548th RTG. US Air Target Chart, Series 200, Sheet M0380-4HL. 4th edition,  
April 1968, Scale 1:200,000 (SECRET)

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Documents

I. CIA. RCS 13/0235/69, Hungnam Nitrogen Fertilizer Plant, Hungnam,  
North Korea, June 1969, (TOP SECRET RUFF)

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Requirement

COMIREX NO2  
Support Number 420103

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